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10/796,755

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Raja Neogi

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INTEL CORPORATION  
c/o INTELLEVATE, LLC  
P.O. BOX 52050  
MINNEAPOLIS, MN 55402

EXAMINER

SAUNDERS JR, JOSEPH

ART UNIT

PAPER NUMBER

2615

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/796,755

Applicant(s)

NEOGI, RAJA

Examiner

Joseph Saunders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This is the initial office action based on the application filed March 8, 2004.

Claims 1 – 33 are currently pending and considered below.

### *Drawings*

2. The drawings are objected to because Figure 4 contains formulas with improper notation. In particular the formula of block 406 should have a "pi" symbol not a "product" symbol and should also include a set of parenthesis e.g.,  $(\pi/64)$ . The formula of block 410 contains the line " $V(n,i+1), V(n-1,i), V(n-1,i+1)$ " separated by comas therefore rendering it is unclear as to what  $V(n,i)$  is supposed to be less than. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities: In paragraph 30 "five samples" should be corrected to "five thousand samples". The specification also contains the formulas objected to in the Drawings section above and should also be clarified.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 4 – 11, 15 – 22, and 26 – 33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 4, 15, and 26 from which claims 5 – 11, 16 – 22, and 27 – 33 depend recite the limitation "performing feature extraction", however when referring to the specification and the drawings to see what is meant by "feature extraction" the specifics regarding the formula used are unclear. The formula states that

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the value of "1" is assigned to  $F(n,i)$  if  $V(n,i)$  is less than " $V(n,i+1)$ ,  $V(n-1,i)$ ,  $V(n-1,i+1)$ " otherwise a value of "0" is assigned. The formula is unclear because one of ordinary skill in the art would not understand if the value of "1" should be assigned to  $F(n,i)$  if  $V(n,i)$  is less than all three values e.g.,  $V(n,i+1)$ ,  $V(n-1,i)$ , and  $V(n-1,i+1)$ , or less than any one of the three values e.g.,  $V(n,i+1)$ ,  $V(n-1,i)$ , or  $V(n-1,i+1)$ , or less than some combination of the three values.

### ***Claim Rejections - 35 USC § 101***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23 – 33 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 23 is directed toward a machine-readable medium containing instructions which, when executed by a processing system, cause the processing system to perform a method. However when referring to the specification to see what support is given to the "medium", it becomes clear that the applicant is trying to incorporate non-statutory subject matter i.e., "transmission over the Internet, electrical, optical, acoustical or other forms of propagated signals (e.g., carrier waves, infrared signals, digital signals, etc.) or the like," Paragraph 14.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1 – 4, 7, 8, 11 – 15, 18, 19, 22 – 26, 29, 30, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Haitsma et al. (A Highly Robust Audio Fingerprinting System), hereinafter Haitsma.

**Claim 1:** Haitsma discloses a method, comprising: receiving an unlabeled audio clip; processing the unlabeled audio clip to extract an audio fingerprint; determining a stored audio fingerprint that matches the extracted audio fingerprint; and determining a labeled audio clip based on the stored audio fingerprint (Abstract and Introduction: Paragraph 3).

**Claim 12:** Haitsma discloses a system (A Highly Robust Audio Fingerprinting System), comprising: an audio fingerprint generator (Extraction Algorithm); and a database (fingerprint database), wherein the audio fingerprint generator receives an unlabeled audio clip and wherein the audio fingerprint generator processes the unlabeled audio clip to extract an audio fingerprint, wherein the database determines a stored audio fingerprint that matches the extracted audio fingerprint and wherein the database determines a labeled audio clip based on the stored audio fingerprint (Abstract and Introduction: Paragraph 3).

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**Claim 23:** Haitsma discloses a machine-readable medium containing instructions ("fingerprinting algorithm has been shown to run efficiently on portable devices such as a PDA or mobile phone," Extraction Algorithm: Paragraph 6. Therefore, since the algorithm runs on an electronic device the machine-readable medium is inherent.) which, when executed by a processing system, cause the processing system to perform a method, the method comprising: receiving an unlabeled audio clip; processing the unlabeled audio clip to extract an audio fingerprint; determining a stored audio fingerprint that matches the extracted audio fingerprint; and determining a labeled audio clip based on the stored audio fingerprint (Abstract and Introduction: Paragraph 3).

**Claim 2:** Haitsma discloses the method of claim 1, further comprising: determining information about the labeled audio clip; and providing the information to a user (Introduction: Paragraph 3).

**Claim 3:** Haitsma discloses the method of claim 2, wherein the unlabeled audio clip is a song (Abstract).

**Claim 4:** Haitsma discloses the method of claim 1, wherein processing the unlabeled audio clip to extract an audio fingerprint comprises: receiving an audio signal representing the unlabeled audio clip (Abstract); down-sampling the received audio signal into a mono audio stream ("Since the algorithm only takes into account frequencies below 2kHz the received audio is first down sampled to a mono audio

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stream with a sampling rate of 5kHz," Extraction Algorithm: Paragraph 6); processing the down-sampled audio signal by generating frequency domain coefficients to produce one or more audio samples ("Fourier coefficients," Extraction Algorithm: Paragraphs 1 and 3); performing feature extraction of the one or more audio samples to produce a compact data representation (Extraction Algorithm: Paragraph 4 see Equation 1); and packing the compact data representation into one or more sub-fingerprints (Extraction Algorithm: Paragraph 5).

**Claim 7:** Haitisma discloses the method of claim 4, wherein the received audio signal is uncompressed ("Figure 2a and Figure 2b show a fingerprint block from an original CD and the MP3 compressed (32Kbps) version of the same excerpt, respectively," Extraction Algorithm: Paragraph 5. Therefore, the algorithm is applicable to compressed and uncompressed received audio signals).

**Claim 8:** Haitisma discloses the method of claim 4, further comprising combining the one or more sub-fingerprints to create a fingerprint block ("Figure 2 shows an example of 256 subsequent 32-bit sub-fingerprints (i.e. a fingerprint block)," Extraction Algorithm: Paragraph 5).

**Claim 11:** Haitisma discloses the method of claim 4, wherein the sub-fingerprint is 32 bits ("Figure 2 shows an example of 256 subsequent 32-bit sub-fingerprints (i.e. a fingerprint block)," Extraction Algorithm: Paragraph 5).



**Claims 13 – 15, 18, 19, 22, 24 – 26, 29, 30, and 33:** Claims 13 – 15, 18, 19, and 22 directed to a system and 24 – 26, 29, 30, and 33 directed to a machine-readable medium are substantially similar in scope to claims 2 – 4, 7, 8, and 11 and therefore are rejected for the same reasons above.

9. Claims 9, 20, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Haitsma and Pohlmann (Principles of Digital Audio Fourth Edition), hereinafter Pohlmann (See MPEP 2131.01, Multiple Reference 35 U.S.C. 102 Rejections).

**Claim 9:** Haitsma discloses the method of claim 4, wherein the received audio signal has a sample rate of 44.1 kHz (Haitsma discloses “CD”, Extraction Algorithm: Paragraph 5 and Pohlmann discloses the sampling rate of a CD is 44.1 kHz, Page 245. Haitsma also discloses starting with a signal with a 44.1 kHz sampling rate in an example situation of signal degradation, see Resampling under Experimental Robustness Results) and wherein down-sampling the received audio signal into a mono audio stream comprises down-sampling the received audio signal into a mono audio stream with a sampling rate of 5 kHz (“Since the algorithm only takes into account frequencies below 2kHz the received audio is first down sampled to a mono audio stream with a sampling rate of 5kHz,” Extraction Algorithm: Paragraph 6).

**Claims 20 and 31:** Claim 20 directed to a system and claim 31 directed to a machine-readable medium are substantially similar in scope to claim 9 and therefore are rejected for the same reasons above.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 10, 21, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitsma in view of Pohlmann.

**Claim 10:** Haitsma discloses the method of claim 4, where down-sampling the received audio signal into a mono audio stream comprises down-sampling the received audio signal into a mono audio stream with a sampling rate of 5 kHz ("Since the algorithm only takes into account frequencies below 2kHz the received audio is first down sampled to a mono audio stream with a sampling rate of 5kHz," Extraction Algorithm: Paragraph 6). Haitsma does not disclose wherein the received audio signal has a sample rate of 48 kHz. Haitsma does disclose that the source of the audio signal may come from many sources including AM/FM radio signals, GSM cellular signals, and signals stored on CD to name a few. Pohlmann discloses another source of digital audio, DVD-Audio, supporting higher sampling rates of 48, 88.2, 96, 176.4, and 192 kHz therefore offering

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improved sound quality over CD at 44.1 kHz, Page 390. Since the source of the audio signal may vary and the purpose is to show a robust fingerprinting system for all types of signals, it would have been obvious to one of ordinary skill in the art to apply the invention of Haitsma to a DVD-Audio signal as shown by Pohlmann therefore allowing for higher quality audio signals to also be fingerprinted for identification purposes.

**Claims 21 and 32:** Claim 21 directed to a system and claim 32 directed to a machine-readable medium are substantially similar in scope to claim 10 and therefore are rejected for the same reasons above.

12. Claims 5, 6, 16, 17, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitsma in view of Konstantinides (5,508,949), hereinafter Konstantinides.

**Claims 5 and 6:** Haitsma discloses the method of claim 4, wherein processing the down-sampled audio signal by generating frequency domain coefficients to produce one or more audio samples comprises: segmenting the down-sampled audio signal into one or more frames ("First the audio signal is segmented into frames," Extraction Algorithm: Paragraph 1). Haitsma also discloses having the frequency spectrum of the down-sampled audio signal divided into a number of bands so that properties of the down-sampled audio signal can be captured (See Figure 1: Band Division Stage and Energy Computation Stage). Haitsma does not disclose performing inverse discrete cosine

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transform on the one or more frames, wherein performing inverse discrete cosine transform on the one or more frames captures properties of the down-sampled audio signal. Konstantinides discloses a method of fast subband filtering "including an analysis filter in which an inverse discrete cosine transform is employed," Abstract. Konstantinides teaches that subband filtering is compute intensive operation and the use of the IDCT allows for a reduction in multiplication and addition operations (Column 1 Line 65 – Column 2 Line 21) and the invention "although described in connection with the MPEG coding standard, is considered useful for other coding applications and standards," Column 3 Lines 43 – 46. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the fast subband filtering as disclosed by Konstantinides in the system of Haitsma thereby allowing for improved computational speeds in the band division stage necessary for capturing energy properties of the individual bands.

**Claims 16, 17, 27, and 28:** Claims 16 and 17 directed to a system and 27 and 28 directed to a machine-readable medium are substantially similar in scope to claims 5 and 6 and therefore are rejected for the same reasons above.

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571)

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270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JS  
June 15, 2007



**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**